

Upper Story Redevelopment: Strategies for Your Downtown
Office for Commonwealth Development

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Sullivan Code Group

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Agenda

Chapter 34: Existing Buildings

- Chapter 34: Repair, Alteration, Addition, and Change of Use of Existing Structure
 - BOCA National Building Code: Chapter 34
 - Massachusetts State Building Code: Chapter 34





BOCA National Building Code

Chapter 34: Existing Buildings

- Buildings modified by addition, alteration or change in use are required to:
 - Comply with the requirements for new construction, or
 - Comply with BOCA Chapter 34
- Chapter 34 Evaluation:
 - Point system
 - Building characteristics and systems (i.e. height & area, fire protection systems, means of egress, HVAC, etc.) are scored separately
 - Sum must meet minimum level based on building occupancy



Example

BOCA Chapter 34: Existing Buildings

Sprinkler Protection



3408.6.17.1 Categories: The categories for automatic sprinkler system protection are:

- Category a Sprinklers are required throughout; sprinkler protection is not provided or the sprinkler system design is not adequate for the hazard protected in accordance with Section 906.0.
- Category b Sprinklers are required in a portion of the building; sprinkler protection is not provided or the sprinkler system design is not adequate for the hazard protected in accordance with Section 906.0.
- Category c Sprinklers are not required; none are provided.
- Category d Sprinklers are required in a portion of the building; sprinklers are provided in such portion; the system is one which complied with the code at the time of installation and is maintained and supervised in accordance with Section 924.1.
- Category e Sprinklers are required throughout; sprinklers are provided throughout in accordance with Chapter 9.
- Category f Sprinklers are not required throughout; sprinklers are provided throughout in accordance with Chapter 9.

Table 3408.6.17 SPRINKLER SYSTEM VALUES

lles eroups	Categories					
Use groups	a	b	C	d	е	f
A-1, A-3, F, M, R, S-1 A-2	-6 -4	-3	0	2	4	6
A-4, B, E, S-2	-12	-6	0	3	6	12



Table 3493.7 SUMMARY SHEET — BUILDING SCORE

3			·· ·· · · · · · · · · · · · · · · · ·		The same transfer was at his to
Existing use group			Proposed use group		
Year building was constructed			Number of stories		in feet
Type of construction			Area per floor		
Percentage of open perimeter	%		Percentage of height reduction	ــــــــــــــــــــــــــــــــــــــ	
Completely suppressed:	Yes	No	Corridor wall rating		
Compartmentation:	Yes	No	Required door closers:	Yes	No
Fireresistance rating of vertical opening	ng enclosures 🔔				
Type of HVAC system	·			OHRE BROKE WAS	
Automatic fire detection:	Yes	Мо			478.1 7
Fire alarm system: Smoke control:	Yes	No			
Adequate exit routes:	Yes	No,	 		
Maximum exit access travel distance	Yes	No	Dead ends: Elevator contrels:	Yes	
Means of egress emergency lighting:	Yes	No		Yes Yes	
	163				
Safety parameters		Fire safety (FS)	Means of egress (M	FY	General safety (GS)
3408.6.1 Building height	<u> </u>		21 031000 (111		uurus (uo)
3408.6.2 Bullding area				······································	
3408.6.3 Compartmentation	— , 	- Unite Company (#14)	,, ,, ,, ,, ,, ,, ,, ,, ,, ,,,,		- 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100
3408.6.4 Tenant and dwelling unit sep	arations				
3408.6.5 Corridor walls					
3408.6.6 Vertical openings					
3408.6.7 HVAC systems					20 N. I. CO. 10 IV. 100
3408.6,8 Automatic fire detection					
3408,6.9 Fire alarm system					
3408.6.10 Smoke control					
3408.6.11 Means of egress		***			10.00
3408.6.12 Dead ends		4 4 4 4			
3408.6.13 Max. travel distance		****			-
3408.6.14 Elevator control					
3408.6.15 Means of egress emergency	y lighting	* * * * * * * * * * * * * * * * * * *		2. 2. 2.4	·
3408.6.16 Mixed use groups		24	* * * *	- 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100	
3408.6.17 Sprinklers			+ 2 =		
3408.6.18 Specific occupancy area pro	otection				2000 20 0 2001 3 334
Building score — total value				M.	
* * * No applicable value to be inserted.			; 		**

RWS

Mandatory Safety Scores

BOCA Chapter 34: Existing Buildings

Table 3408.8 MANDATORY SAFETY SCORES^a

Use Group	Fire safety (MFS)	Means of egress (MME)	General safety (MGS)
A-1 A-2	16 19	27 30	27 30
A-4 E	29. 24.	29 94 - 34 - 34	34 34
M R	19 17	36 34	36 36 34
S-1 S-2	S-1 15 S-2 23		25 33

Note a. MFS = Mandatory Fire Safety;

MME = Mandatory Means of Egress;

MGS = Mandatory General Safety.

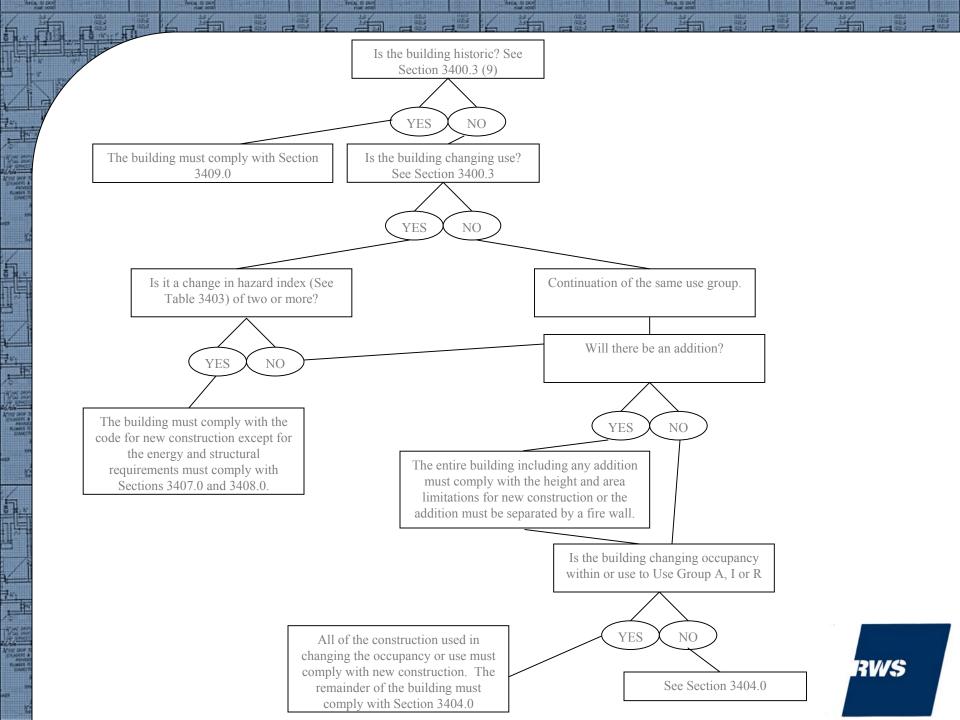


Massachusetts State Building Code

- Chapter 34: Repair, Alteration, Addition, and Change of Use of Existing Buildings
 - Applicability (3400.3)
 - Assembly, Institutional & Residential Use Groups
 - Historic Buildings
 - Additions
 - Continuation of the Existing Use Group
 - Change in Use & The Hazard Index
 - Investigation and Evaluation Report
 - Continuation of the Same Use or Change in Use Resulting in a Change in Hazard Index of One or Less (3404.0)
 - Change in Use Resulting in a Change in Hazard Index of Two or Greater (3405.0)
 - Energy Code (3407.0)
 - Structural Requirements for Existing Buildings (3408.0)
 - Compliance Alternatives (3406.0)







Applicability (3400.3)

Massachusetts State Building Code

- Scoping
- Chapter 34 Report
- Continuation of the Existing Use Group
- Change in Use & Hazard Index
- Assembly, Institutional & Residential Use Groups
- Historic Buildings
- Additions



Hazardous Means of Egress

Sections 3400.4, 3400.6 and 3400.6

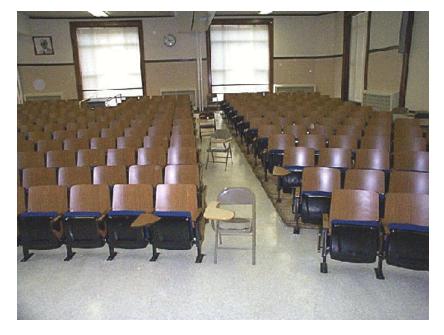
- Existing Non Conforming Means of Egress (Section 3400.4)
 - The following violations shall be cited by the building official:
 - Less than the number of means of egress required by Section 1010.0 and Table 1010.2.
 - Any required means of egress component which is not of sufficient width.
- Hazardous Means of Egress (Section 3400.5)
 - If the exits are not compliant with new construction and the building official deems them dangerous to life and limb, the building official shall declare the building unsafe and order it evacuated.
- Unsafe Lighting and/or Unsafe Ventilation (Section 3400.6)
 - If the lighting and ventilation are not compliant with new construction and the building official deems them dangerous or hazardous to the health and safety of the occupants, the building official shall order the abatement of such conditions to render the building or structure livable.



<u>Assembly, Institutional &</u> <u>Residential Use</u>

Applicability (3400.3)

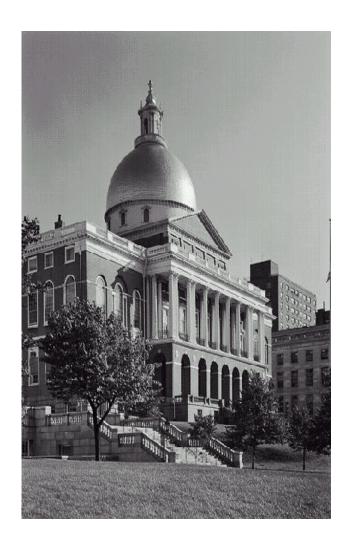
A change from any other occupancy to an assembly (Use Group A), institutional (Use Group I), or residential (Use Group R) use or any alteration or change in occupancy within one of these use groups must comply with the code requirements for new construction, except that earthquake requirements need only conform to Section 3408.0.





<u>Historic Buildings</u>

Applicability (3400.3)



- Historic buildings are only required to comply with the specific requirements contained within Section 3409.0.
- All legally designated historic buildings are exempt from the energy conservation and structural requirements of Chapter 34. However, partially preserved historic buildings are not exempt from the wind load requirements.



Additions Applicability (3400.3)

- Required to comply with the code requirements for new construction.
- Combined height and area of the existing building and the addition must comply with the limitations for new construction.
- When a fire wall is provided between the addition and the existing building, the addition is considered as a separate building and only the height and area of the addition are required to comply with the code requirements for new construction.





Chapter 34 Report

- Investigation and Evaluation Report (3402.0)
 - Required for all alterations to existing buildings.
 - Evaluation to determine the effects of the proposed work on the structural, egress, fire protection, energy conservation systems and light and ventilation systems of the space under consideration and, where necessary, the entire building or structure.
 - Results must be submitted to the building official in the form of a written report.
 - Report must also include documentation of any proposed compliance alternatives.
 - Guidelines included in MSBC Appendix F.





Compliance Alternative

Section 3406.0

- Compliance Alternatives (3406.0)
 - Permitted for renovated buildings where compliance is impractical because of construction difficulties.
 - Must be approved by the building official.
 - Examples of previously accepted compliance alternatives are contained in Appendix F.





Continuation of the Existing Use Group

Applicability (3400.3 (1))

- Renovations must comply with Section 3404.0.
- Compliance with the code requirements for new construction is not required unless specifically referenced in this section or elsewhere in Chapter 34 (i.e. structural requirements contained in Section 3408.0).



Change in Use

Applicability (3400.3 (2))

- Required compliance dependant upon Hazard Index classifications of new and existing occupancies.
- Change in Hazard Index of One or Less:
 - Renovations must comply with Section 3404.0.
- Change in Hazard Index of Two or Greater:
 - Must comply with the code requirements for new construction except as provided in Section 3407.0 Energy Conservation and Section 3408.0 for Structural Requirements.

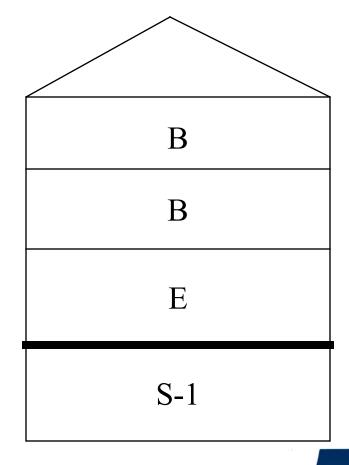




Part Change in Use

Applicability (3400.3 (3))

- When only a portion of an existing building undergoes a change in use, the renovations must comply with either one of two options:
 - Nonseparated Occupancies
 - Entire building must comply with the requirements of Chapter 34 based on the most restrictive use.
 - Separated Occupancies
 - Each portion of the building is required to comply with the requirements of Chapter 34 based on the particular occupancy classification and extent of the renovations in that area.





Hazard Index (3403.0)

Applicability (3400.3)

Table 3403 HAZARD INDEX

USE GROUP ⁽¹⁾	DESCRIPTION	HAZARD INDEX NO. ⁽²⁾
A-1	Theater with stage	6
A-2	Night Club	7
A-3	Theater without stage	5
A-3	Restaurant	5
A-3	Lecture hails, recreations centers, museums, libraries, similar assembly buildings	4
A-4	Churches	4
В	Business	2
E	Educational (K through 12)	4
_F	Factory and industrial	3
H	High hazard	8
1-1.1-3	Institutional restrained	5
E-2	Institutional incapacitated	+
М	Mercantile	_ ;
R-1	Hotels, motels	2
R-2	Multi-family	2
R-3	One and two family	2
S-1	Storage, moderate hazartí	3
S-2	Storage, low hazard	

Notes to Table 3403:

- (1) See 780 CMR 3 and 4 and Appendix F.
- (2) Hazard Index Modifier for selected construction types as follows:
 - (a) When a building is classified in construction Type 1A, 1B, 2A, or 2B, subtract one from the Hazard index shown in Table 3403 for the applicable proposed new use group only.
 - (b) When a building is classified in construction Type 2C or 5B, add one to the *Hazard index* shown in Table 3403 for the applicable proposed new use group only. Exception: *Partially Preserved Historic Buildings* (780 CMR 3409).



Continuation of the Same Use or Change in Use Resulting in a Change in Hazard Index of One or Less Section 3404.0

- Requirements exceeding those required for new construction (3404.2):
 - Features in existing buildings which are not required by the code for new construction can be removed from existing buildings.
 - Fire protection devices can not be disconnected, obstructed, removed, shut off, or destroyed without receiving written approval from the head of the local fire department.0





Continuation of the Same Use or Change in Use Resulting in a Change in Hazard Index of One or Less Section 3404.0

- New building systems & Alterations and repairs to existing building systems (3404.3 & 3404.4):
 - Alterations, repairs or replacement of existing building systems with the same or like materials.
 - Any new building system, or alterations or repairs which have the effect of replacing a building system as a whole, must conform to the code requirements for new construction to the fullest extent practical.





Continuation of the Same Use or Change in Use Resulting in a Change in Hazard Index of One or Less Section 3404.0

Means of Egress:

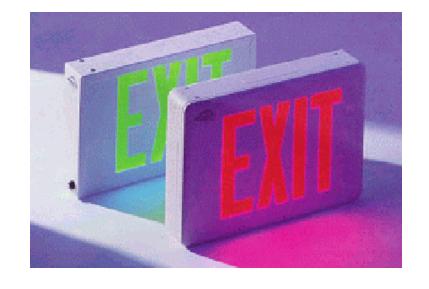
- Number of Exits: Every floor or story must be provided with the minimum number of exits specified in MSBC Table 1010.2 for new construction, and which are acceptable to the building official (Section 3404.5).
- Exit Capacity: All required means of egress must provide the minimum exit capacity required for new construction in MSBC Section 1009.0 (Section 3404.6).
- Existing means of egress which are deemed to be hazardous or dangerous to life and limb by the building official must be cited in writing (3400.4.1).





Continuation of the Same Use or Change in Use Resulting in a Change in Hazard Index of One or Less Section 3404.0

- Exit Signs and Emergency Lighting
 - Must be provided throughout all renovated areas in accordance with the code requirements for new construction (Sections 3404.7 & 3404.8).





Continuation of the Same Use or Change in Use Resulting in a Change in Hazard Index of One or Less Section 3404.0

Height and Area Limitations

- Only applicable to existing buildings which are modified by addition or change in use.
- Where a building is modified by addition or change in use, the structure must comply with the height and area limitations for new construction based on the occupancy and construction type classifications.

Existing Fire and Party Walls

 Existing fire and party walls are not required to comply with the code requirements for new construction.
 These walls can continued to serve as the required separation between two adjacent buildings.





Continuation of the Same Use or Change in Use Resulting in a Change in Hazard Index of One or Less Section 3404.0

- Fire Protection Systems (Section 3404.12)
 - Additions: Fire protection systems must be provided in all additions in accordance with the code requirements for new construction.
 - Existing Buildings: Where required by Chapter 9 for new construction, existing buildings are required to be provided with fire protection systems when the building is substantially renovated.
 - A substantial renovation is defined as work which is major in scope and expenditure when compared to the work and expenditure required for the installation of a fire protection system. The building official determines whether the work constitutes a substantial renovation and may request the owner or applicant to provide supporting information necessary to make such determination.





Continuation of the Same Use or Change in Use Resulting in a Change in Hazard Index of One or Less Section 3404.0

- Existing Stairways (Section 3404.13)
 - Open stairways are not permitted within existing buildings unless otherwise allowed by the code for new construction (see exceptions to MSBC Section 713.3).
 - No required rating for existing construction enclosing a stairway.
 - 1 hour minimum rating for any new construction added to fully and solidly enclose an existing stairway.
 - All stairway doors (existing and new) must be self-closing and tight fitting with approved hardware.





Continuation of the Same Use or Change in Use Resulting in a Change in Hazard Index of One or Less Section 3404.0

- Fire Hazard to Adjacent Buildings (3404.17)
 - Any proposed change in use or occupancy which has the effect on increasing the fire hazard to adjacent buildings must comply with the requirements of Table 705.2 for exterior wall fireresistance rating requirements, or an approved compliance alternative must be provided.

Table 705.2 EXTERIOR WALL FIRERESISTANCE RATINGS^b

Terra de la companya della companya						
· · · ·	Use Group					
Fire Separation distance (feet)	H-2	F-1, H-3, M, S-1	R-2	R-3	A. B. E. F-2. H-4, 1, R-1. S-2	
0 to 5 Greater than 5 to 10 Greater than 10 to 15 Greater than 15 to 30	4 3 2 1	3 2 8 1	1 1 0	1 0 0 0	2 1 0 0	
Greater than 30	0	0	0	0	0	

Note a. For requirements for Use Group H-1, see 780 CMR 705.2.1.

Note b. Fireresistance ratings are expressed in hours. Note c. 1 foot - 304.8 mm.



Continuation of the Same Use or Change in Use Resulting in a Change in Hazard Index of One or Less Section 3404.0

- Existing Lighting and Ventilation
 - Existing lighting and ventilation within existing buildings are permitted to remain unless deemed to be dangerous or hazardous to the health and safety of the occupants (Section 3400.6).
- Accessibility for Persons with Disabilities
 - Existing building accessibility must comply with the requirements of 521 CMR: Massachusetts Architectural Access Board Rules and Regulations.
- Energy Conservation
 - Alterations to any existing building systems which affect energy conservation are required to comply with the energy conservation requirements of Section 3407.0.





Change in Use Resulting in a Change in Hazard Index of Two or Greater Section 3405.0

- Alterations to an existing building which involve a change in use resulting in a change in Hazard Index of two or greater are required to comply with the code requirements for new construction, with the following exceptions:
 - Structural systems are required to comply with Section 3408.0.
 - Renovations affecting energy conservation are required to comply with Section 3407.0.
 - Accessibility requirements must comply with 521 CMR.



Energy Code

Section 3407.0

- General
 - Establishes energy provisions for existing buildings subject to 780 CMR 3404.0 or 3405.0
- Compliance
 - 780 CMR 3407, Table 3407 and applicable subsections of 780 CMR 13.0, or;
 - 780 CMR 1314.4 and applicable subsections of 780 CMR 13.0, or;
 - 780 CMR 1314.5 and applicable subsections of 780 CMR 13.0 , or;
 - 780 CMR 1315.0 in it's entirety , or;
 - 780 CMR 1314.4, or;
 - Appendix J, as applicable
- Compliance exceptions
 - Fenestration
 - Ordinary repairs
 - Roofs



Energy Code

Section 3407.0

TABLE 3407 COMPONENT VALUES FOR ALTERED ELEMENTS

WALLS	All wall construction containing heated or mechanically cooled space	0-00g	6,8
Foundation Walls Including Band	Containing heated or mechanically cooled space Containing unbased space	U-0.08 U-0.17	4
	Wood plank and beam construction containing heated or mechanically cooled space	80.0-U	1
Roof/Ceiling Assembly	Construction other than wood plank and beam containing heated or mechanically cooled space	0.05	
Windows and Skylights	All construction enclosing beated or membanically cooked space	For windows, see Note 2. For skylights - no current restriction on "U" value	2, \$ 6, 7
Floors	Floor sections over area exposed to outside air or unheated areas Unheated stab on grade	U-0.08 R-5.50	3
	Reated slab on grade	R-7.75	
Mechanical Equipment	Heating, cooling, sizing and efficiency	780 CMR 1305.0	9
Equipment Controls	Humidiseass, thermospass & zoning	780 CMR 1305.0,	9
Duct and Pipe Insulation and Construction	Located in or op buildings	780 CDAIR 1305.0	
Electrical Power Discribucion.	•	780 CMIR 1307.0	
Lighting	Lighting	780 CMR 1308.0	

- Note 1. Wood plank and beam assemblies are constructions in which the finished interior surface is the underside of the roof deck.
- Note 2. For existing low-rise residential buildings, commencing January 1, 1999, the maximum allowed thermal transmittance of replacement windows, with or without a storm window, shall be 0.44 and such windows and window with storm window combinations will be NFRC listed labeled. For all other existing building types (commercial/high-rise), window thermal transmittance requirements shall conform to the requirements of 780 CMR 13 generally and 780 CMR 1304.2 or 1304.5 or 1309, as applicable. Refer also to 780 CMR 3407.0 Exceptions 1 and 2.
- Note 3. Insulation may be omitted from floor over unheated areas when foundation walls are provided with a U value of 0.17.
- Note 4. The U value requirement of 0.17 for foundation walls may be omitted when floors over unheated spaces are provided with a U value of 0.08.
- Note 5. Refer to 780 CMR Appendix J Table J4.3.2 for allowable air infiltration rates for residential doors and windows. Allowable rate for commercial doors is 11 cfm/lin. ft of operable sash crack.
- Note 6. The first floor exterior envelope of business and mercantile use groups shall have an overall thermal transmittance value not greater than 0.65 in lieu of individual components values for walls and fenestration.
- Note 7. When the glass area is increased, the glass and wall components which are altered shall comply with the component values in Table 3407. The extent of wall made to comply shall be equivalent to the decreased opaque wall area.
- Note 8. When any alterations to the exterior wall component exposes the wall cavity or, when a finished system is added to a wall having no cavity, the wall must comply with the values Table 3407.
- Note 9. When mechanical system compliance is required on an existing system, only portions of the system altered and any other portions which can reasonably be incorporated need comply.



Structural Requirements for Existing Buildings

Section 3408.0

 Evaluation of Existing Buildings (3408.2)

- A registered professional structural engineer must evaluate an existing building determine the adequacy of al structural systems that will be affected by an alteration, addition, change of use, or damage to be repaired.
- A report on the structural evaluation must be submitted the building official with the application for the building permit.





Structural Requirements for Existing Buildings

Section 3408.0

- Structural Design Requirements
 - In general, with the exception of earthquake loads, structural elements affected by an alteration must provide the strength required by current accepted engineering practice, or by the applicable design codes at the time of original construction, provided the applicable portions of those codes have not been found to endanger public safety.
 - Structural elements within existing buildings must comply with the seismic design criteria of Section 3408.0.



Seismic Design Criteria

Section 3408.5.4

Seismic Hazard Category

 The required compliance with the seismic design criteria in Section 3408.0 is based on the Seismic Hazard Category specified in Table 3408.1.

Table 3408.1 SEISMIC HAZARD CATEGORY

	CHANGE IN OCCUPANCY OR COST OF ALTERATIONS				
CHANGE IN USE (1)	Occupancy increased by more than 25% and to a total occupancy of 100 or more; or total cost of alterations exceeds 50% of the assessed valuation of the building. (2)	All other changes in occupancy, and total cost of alterations less than or equal to 50% of assessed valuation of the building. (7)			
Change from Use Group with Hazard Index less than 4 to Use Group with Hazard Index of 4 or greater; or Seismic Hazard Exposure Group III per Table 1612.2.5	3	2			
All other changes in Use Group, or no change in Use Group.	2(3)	¹ (3)			

Note 1. Refer to Table 3403 and Appendix F. Table F-1 for the *Hazard Index* of any use group. Adjustments to the *Hazard Index* indicated in the footnotes to Table 3403 shall not be applied for determination of *Sessmic Hazard Category*.

Note 2. Total cost of alterations shall include the cost of alterations proposed under the current building permit application, plus the cost of any alterations covered by building permits in the two-year period preceding the date of the current permit application. The assessed valuation shall be as of the date of the current building permit application. Note 3. When there is no change in use, the following costs may be excluded from the total cost of alterations:

- a. Costs incurred by requirements for compliance with the following:
- Americans With Disabilities Act
- ii. Massachusetts Architectural Access Board Regulations, 521 CMR
- iii M.G.L. c. 148, § 26A% requiring sprinklers in existing high-rise structures.

b.Costs incurred for improvements in:

- i Sprinklering
- ii. Smoke and heat detection
- iii. Fire alarm systems
- iv. Exit enclosures



Seismic Design Criteria

Section 3408.5.4

- Seismic Hazard Category 1 (3408.5.4.3)
 - Alterations shall not be made to elements of systems contributing to the lateral load resistance of a building which would reduce their capacity to resist lateral loads, unless:
 - The lateral load resisting system of the altered building complies with the code requirements for new construction, or
 - The altered lateral load resisting system conforms to all applicable minimum load requirements of Section 3408.0, and there is no reduction in the lateral load capacity of the building as a whole.



<u>Seismic Design Criteria</u>

Section 3408.5.4

- Seismic Hazard Category 2 (3408.5.4.4)
 - In addition to compliance with the requirements for Seismic Hazard Category 1, the existing building must also be investigated for the presence of the following special earthquake hazards:
 - Parapets: All parapets not meeting the design requirements for new construction contained in MSBC Section 1612.0 must be removed or adequately braced.
 - Masonry Walls: All masonry walls must be connected to floor or roof diaphragms, or other elements providing lateral support, to comply with the requirements for new construction contained in MSBC Section 1612.7.
 - Precast Concrete Structural Elements: Interconnections of precast concrete structural elements shall be investigated and reinforced if necessary to comply with the code requirements for new construction contained in MSBC Chapter 19.



Seismic Design Criteria

Section 3408.5.4

- Seismic Hazard Category 3 (3408.5.4.5)
 - Full compliance with the code provisions for new construction is required, except as modified by Section 3408.0.



521 CMR: Massachusetts Architectural Access Board

- Existing Buildings: Renovations (3.3)
 - The level of compliance for existing buildings subject to renovation is based on the cost of the renovations:
 - Work costs less than \$100,000: only the work being performed is required to comply.
 - Work costs \$100,000 or more but less than 30% of the assessed value of the existing building: in addition to the work being performed, an accessible public entrance and an accessible toilet room, telephone and drinking fountain must comply with 521 CMR (if public toilets, telephones and drinking fountains are provided).
 - Exempt Work: Curb cuts, MEP without architectural alterations, roof repair or replacement, window repair or replacement, repointing and masonry repair, septic systems, site utilities, and landscaping.



521 CMR: Massachusetts Architectural Access Board

- Existing Buildings: Renovations (3.3), con't
 - Cost of work is equal to 30% or more of the assessed value of the existing building: the entire building is required to comply with 521 CMR.
 - Exempt Work: None



521 CMR: Massachusetts Architectural Access Board

 In determining the applicability of 521 CMR, the cost of all work performed within a 3 year period must be added together.



ADA: 28 CFR Part 36

- Existing Buildings: Alterations (36.402, 36.403)
 - Altered portions of a facility are required to comply with the accessibility regulations to the maximum extend feasible.
 - The accessibility of the path of travel and facilities (toilet rooms, drinking fountains, etc.) serving an altered area must also be improved as part of the renovation, unless the cost and scope of such alteration is disproportionate to the cost of the overall alteration.
 - Alterations to a path of travel or facilities serving an altered area are considered to be disproportionate to the overall alteration when the cost exceeds 20% of the cost of the primary alteration.
 - If the cost of alterations to the path of travel or facilities is disproportionate, these areas must still be improved up to 20% of the cost of the primary alteration.
 - Alterations by a tenant in areas that only the tenant occupies do not trigger an obligation for the landlord to improve the accessibility of the path of travel or facilities used by the tenant, if those areas are not otherwise being altered.



ADA: 28 CFR Part 36

- Existing Buildings: Removal of Barriers (36.304)
 - In existing buildings classified as a place of public accommodation, existing architectural barriers are required to be removed where such removal is able to be carried out without much difficulty or expense.
 - Priorities
 - Provide accessible route and entrance to facility.
 - Provide access to areas within the facility where goods and services are made available to the public.
 - Provide accessible restroom facilities.
 - Take any other measures necessary to provide access to the goods, services, privileges, advantages, or accommodations of a place of public accommodation.

